grants and rural agricultural instruction. The programme for the year also makes the following provisions :—For dairy instruction, £250; for manual instruction in woodwork, £228; for nursing, ambulance, and general hygiene, £190; for dressmaking, £100; for instruction in poultry-keeping, £35; for hedging and thatching, £25. We are very sceptical as to the wisdom of so diffuse a syllabus of work, and would again point out that no efforts should be spared to coordinate and systematise all the educational projects of a County Committee.

A PROSPECTUS referring to the Faculty of Applied Science of McGill University, Montreal, announces that, through the munificence of Mr. W. C. McDonald, a Department of Architecture has been established in the Faculty, and the regular work of the new department will commence with session 1896–97. During the summer, a Professor of Architecture is to be appointed, and the efficiency of the Drawing Department is to be much increased by the addition of a lecturer in freehand drawing and descriptive geometry. The same benefactor has also rendered it possible for the University to place the Departments of Chemistry and Mining in a thoroughly efficient condition. The erection of a large building is to be proceeded with immediately, and the building will be equipped in the most approved manner, including not only provision for the several branches of chemistry, but also for mineralogy, mining, and metallurgy. The Mining and Metallurgical Laboratories alone will have a floor space of about 10,000 square feet, and will be supplied with the most recent appliances for the milling and metallurgical treatment of ores, &c. A Professor of Mining will be appointed during the summer, and other important changes in the staff, all leading to increased efficiency, are to be made.

SCIENTIFIC SERIALS.

Symons's Monthly Meteorological Magazine, May.—The worst gale of the nineteenth century in the English midlands. This storm occurred on March 24, 1895, and has not been fully discussed, although some local scientific societies have published short papers upon it. The present number contains part of the list of damage done in various countries; in the next number it is proposed to complete it, and to offer some general remarks upon the subject. Mr. Symons considers that the damage done is without parallel since "the great storm" of 1703. It is a curious coincidence that it occurred on the same day of the year, and nearly at the same hour, as that of the *Eurydice* squall in 1878, in which, it will be remembered, Her Majesty's ship was lost. This latter storm was discussed by the late Mr. W. C. Ley.—Fog, mist, and haze, by "F. R. Met. Soc." In the hope of initiating a discussion upon the existing absence of unanimity as to the meaning attached to the different words in general use, the author has suggested certain definitions, which are briefly as follows :—Fog; an obscuration due to condensation of aqueous vapour when the particles are too small to be seen with the naked eye. Mist; when the particles are large enough to be seen with the naked eye. Smoke-fog; obscuration without water particles. Haze; an obscuration of distant objects, so slight that the cause is not visible to the observer.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, May 7.—Mr. A. G. V. Harcourt, President, in the chair.—The following papers were read :—Carbon dioxide, its volumetric determination, by W. H. Symonds and F. R. Stephens. The authors describe a trustworthy method of estimating carbon dioxide in air.—On certain views concerning the condition of the dissolved substance in solutions of sodium sulphate, by R. F. D'Arcy. Experiments on the viscosity of strong solutions of sodium sulphate confirm the generally accepted view that the condition of sodium sulphate in aqueous solution is always the same, whether the solutions are prepared from the anhydrous salt or one of its two hydrates.—Luteolin, II., by A. G. Perkin. The results of the further examination of luteolin are given; it is isomeric with fisetin, and probably has the constitution $\begin{matrix} C(OH).CH{:}C.CO \\ \| \quad\quad | \quad\quad \| \\ CH.C(OH){:}C.C(CO).CH \end{matrix}$—$C.C_6H_3(OH)^2$.—Morin, Part I., by H. Bablich and A. G. Perkin. Morin, a yellow colouring matter occurring in old fustic and in Jackwood, is isomeric with, and has a very similar constitution to quercitin.—Synthesis of pentacarbon rings. Part I. Anhydracetonebenzil and its homologues, by F. R. Japp and G. D. Lander. Anhydracetone benzil has been fully investigated, and is shown to be a diphenyl-hydroxycyclopentane of the constitution $\begin{matrix} CPh{=}{=}CH \\ | \quad\quad \diagdown \\ CPh(OH).CH_2 \end{matrix}$ $\diagup$ CO.—Synthesis of pentacarbon rings. Part II. Condensation of benzil with acetonedicarboxylic acid, by F. R. Japp and G. D. Lander. The behaviour towards reagents of anhydracetonebenzilcarboxylic acid, which is obtained by the condensation of benzil with acetonedicarboxylic acid, is described.—Reduction of desyleneacetic acid, and the constitution of Zinin's pyroamaric acid, by F. R. Japp and G. D. Lander. Desyleneacetic acid yields Meyer and Oelker's desylacetic acid on reduction and βγ-diphenylbutyric acid on boiling with hydriodic acid and phosphorus; this acid is identical with Zinin's pyroamaric acid.—Electrolysis of potassium allo-ethylic camphorate, by J. Walker and J. Henderson.—Flourene and acenapthene, by W. R. Hodgkinson. The red substance obtained by the oxidation of flourene and acenaphthene is not a hydrocarbon, but contains oxygen; no coloured hydrocarbon can be prepared by oxidising these substances.

Mathematical Society, May 14.—Major MacMahon, R.A., F.R.S., President, in the chair.—Mr. H. F. Baker spoke upon the bitangents of a plane quartic curve and the straight lines of a cubic surface.—A paper by Prof. E. W. Brown, on the application of the principal function to the solution of Delaunay's canonical system of equations, was taken as read.—Short communications were made by the President, Colonel Cunningham, Prof. Hill, F.R.S., Mr. Hammond, and Mr. Tucker.

CAMBRIDGE.

Philosophical Society, May 11.—Prof. J. J. Thomson, President, in the chair.—Note on the formation of the layers in Amphioxus, by Mr. E. W. MacBride.—Note on the continuity of the mesenchyme cells in Echinoderms, by Mr. E. W. MacBride.—Mr. F. C. Shrubsall read a paper on crania from Teneriffe, embodying the measurements of sixty-one skulls and two hundred long bones. The average height of the islanders, calculated from the latter, was for males 1642 mm. and for females 1552 mm.

EDINBURGH.

Royal Society, May 18.—Prof. Chrystal in the chair.—Mr. W. G. Robson, St. Andrews, exhibited some X-ray photographs, and described the progress of the study at St. Andrews University. Some of the exposures were long compared with what has been done recently, notably by Dr. Macintyre; but the photographs were all very good, and the definitions remarkably clear. Some of the pictures shown were very interesting. A photo of a mummy's foot was exhibited, and Mr. Robson remarked that the rays must have had some effect on the skin, for, at the end of the experiment, it was found to be quite soft. A photograph of what looked at first sight like some insect, but turned out to be a St. Andrews "bulger" with the lead showing very clearly, caused some amusement. Prof. Chrystal thought that uranium would be of great use in intensifying X-ray photographs.—Prof. D'Arcy Thompson made a short preliminary communication on the bird and beast names in Albertus Magnus. There were very many barbarous-looking names for beasts and birds in Albertus Magnus, which have a certain resemblance to words in Aristotle. The Dominican friar did not know Greek, but used an Arabic translation of Aristotle. If the Greek words were transliterated into Arabic, they were found to be parallel with the words used by Albertus when treated in the same way.—Prof. Thompson also read a paper on the Σ of Diophantus. Diophantus used Σ for an unknown quantity. Most commentators take this to be the *s* of *ἀριθμός* ("*ὁ ἀόριστος ἀριθμός*"), but there are difficulties attached to this interpretation. Sometimes the Σ has the sign of the genitive or plural written in small letters beside it, pointing rather to the fact of its being an initial letter. Prof. Thompson suggested *σωρός*, a heap, connected with the heap-calculus of the Egyptians, and gave various reasons for his suggestion. If true, this hypothesis, in linking Diophantus on to the Eastern culture, deprived him of his position as the father of mathematics, and helped to prove that many of his problems, as was conjectured long ago by Morgan and Bonnycastle, were not original but were collected from

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Egyptian mathematicians.—Prof. Thompson next communicated a paper by a pupil, W. T. Calman, on the affinities of the genus *Anaspides* to certain fossil Crustacea. Mr. Calman's re-examination of this remarkable fresh water schizopod from Tasmania has resulted in the discovery of certain important features not observed by its discoverer, notably the presence of what appears to be a group of ocelli on the dorsal surface of the cephalic region. The significance of this, and other morphological peculiarities, was discussed at length, and the indications of divergent affinities with Decapods, Edriophthalmates, and other groups were pointed out. Finally, it was shown that *Anaspides*, while not closely comparable with any living crustacean, possesses strong resemblances to certain Palæozoic crustacea forming the groups *Syncacida* and *Gampsonychidæ* of Packard, whose systematic position has hitherto been a complete puzzle to palæontologists.—Prof. Tait indicated the nature of his paper on the linear and vector function, and promised to give it in detail at an early date.

DUBLIN.

Royal Dublin Society, April 22.—Prof. Grenville A J. Cole in the chair.—Mr. J. R. Kilroe read a paper on the distribution of drift in Ireland, in its relation to agriculture. The relation between the drift and the underlying rocks was discussed, and the general mode of origin and succession of the glacial deposits in Ireland were described. The importance of considering the stones included in sands or clays as sources of fertilising materials was especially dwelt on, and illustrations were given of the physical and chemical constitution of numerous Irish drift deposits. A broad system of separation of the constituents was adopted, such as would be suited to agricultural requirements.—The following abstract of a paper by Prof. T. Rupert Jones, F.R.S., and Mr. J. W. Kirkby (communicated by Prof. Sollas, F.R.S.), on the Ostracoda of the Carboniferous Formations of Ireland, was read March 18, but was not in time for publication in the report of that meeting sent to NATURE. In 1866 Messrs. Jones and Kirkby made a critical examination of all that had been published about the Carboniferous Entomostraca (Ostracoda) of Ireland, in the *Annals and Magazine of Natural History*, ser. 3, vol. xviii., pages 37–51. Having in the interval from 1866 received numerous species of Ostracoda (Podocopa) from the Carboniferous Formations of Ireland, the authors have put them, together with those already tabulated and described, in a convenient arrangement, so that geologists, and naturalists in general, should be able to form their judgment on this branch of the Palæontology of Ireland. Many of the specimens have been treated more or less fully in some of the authors' memoirs scattered in various publications (such as *Annals Mag. N. H.*, *Quart. Journ. Geol. Soc.*, *Geological Magazine*, *Proc. Geol. Assoc.*, *&c.*). Several, however, have not hitherto been adequately illustrated; and, lastly, some are new. Of the species and notable varieties, there are belonging to *Cytherella*, 7; to *Leperditia*, 10; *Beyrichia*, 3; *Beyrichiopsis*, 2; *Kirkbya*, 5; *Ulrichia*, 1; *Bythocypris*, 2; *Macrocypris*, 1; *Argillæciæ*, 1; *Krithe*, 2; *Bairdia*, 8; altogether 42. It is proposed to give a descriptive and bibliographic account of each form, with its range and localities, accompanied by good illustrations. The specimens treated of have come from Donegal, Londonderry, Tyrone, Down, Sligo, Longford, Mayo, and Cork.

PARIS.

Academy of Sciences, May 26.—M. A. Cornu in the chair.—On researches made at the observatory of Madison by G. Comstock, concerning aberration and refraction, by M. Lœwy. The constant of aberration given by these researches is 20″·44.—On the part played by the ring of iron in dynamo-electric machines; reply to the note of M. Potier, by M. Marcel Deprez.—Source and nature of the potential directly utilised in muscular work, from the point of view of the respiratory changes in man after fasting, by M. A. Chauveau. The ratio of carbon dioxide to oxygen, or respiratory quotient, mounts rapidly when muscular work is commenced, falling away, however, if the work is very prolonged. After a rest of one hour the quotient falls to the normal. Fat does not appear to be utilised directly by the muscles, even when the work is done fasting.—The immediate destination of fatty food, by MM. A. Chauveau, Tissot and de Varigny.—On the theory of gases, a letter from M. Boltzmann to M. Bertrand. M. Boltzmann points out that Maxwell himself stated the doubtful nature of his first demonstration. That this one demonstration is false, however, by no means implies that the theorem itself is false, and reference is made to independent proofs by Boltzmann, Lorentz, Kirchhoff, and others.—Reply to the preceding by M. Bertrand. Leaving Maxwell's first demonstration on one side, his second is equally indefensible. While reserving for the present a critical examination of the various proofs advanced, M. Bertrand thinks that, *à priori*, these proofs cannot be real, since all formulæ solving the problems proposed by Maxwell must contain one arbitrary function.—On the vapour pressures of some formic acid solutions, by M. I. M. Raoult. The observations were made by the dynamical method, and give a mean value of 0·713 for the molecular diminution of vapour pressure for formic acid used as a solvent. The ratio of the actual to the theoretical vapour density as found from this number is 1·55, the number obtained by Bineau by direct observation being 1·34.—Description of a mechanical flying machine, by M. Langley (see p. 80).—Letter from M. Graham Bell to M. Langley, on the same subject (see p. 80).—Observations of the sun, made at the observatory of Lyons with the Brunner equatorial during the first quarter of 1896, by M. J. Guillaume.—On the ordinary differential equation of the first order, by M. A. Korkine.—On the conditions of equilibrium of a certain class of systems capable of deformation, by M. B. Mayor.—On a new mode of regulating motors, by M. L. Lecornu.—Remarks on the preceding note, by M. H. Léauté.—On the magnetic torsion of soft iron wire, by M. G. Moreau. An experimental study of the action of a solenoid carrying a current upon a wire under torsion. The increase of torsion observed, called the magnetic torsion, is proportional to the square of the magnetising current, is independent of the diameter of the wire if the latter is small, and is always in the same sense as the original torsion.—Reply to a claim for priority of M. G. Friedel, by M. R. Dongier. The principle utilised was originally due to Fizeau and Foucault.—On the determination of the deviation of the Röntgen rays by a prism, by MM. Hurion and Izarn. The results obtained with an aluminium prism were entirely negative.—On the refraction of the X-rays, by M. Gouy. Using as the source of Röntgen rays the edge of the platinum disc in a Crookes' tube of the "focus" pattern, so that the origin of the rays is practically rectilinear, with prisms of aluminium and of crown-glass, the conclusion is drawn that the index of refraction of the Röntgen rays cannot differ from unity by more than $\frac{1}{200000}$.—Photometry of phosphorescent sulphide of zinc excited by the kathode rays in a Crookes' tube, by MM. C. Henry and G. Seguy. At a fixed pressure the brightness of the zinc sulphide falls off as the experiment is prolonged. There is a certain pressure at which the maximum intensity of light is obtained; a reversal of the current reduces the brightness to about $\frac{1}{37}$ of its original value.—Action of gaseous hydrogen iodide and phosphonium iodide upon thiophosphoryl chloride, by M. A. Besson. The reaction is analogous to that already described for phosphoryl chloride, the products being phosphorus tri-iodide, iodine, hydrogen sulphide, and hydrogen chloride.—On the hydration of pinacoline, by M. Maurice Delacre.—On a new mode of preparation of glyceric acid, by M. P. Cazeneuve. Glycerine is readily oxidised to glyceric acid by silver chloride in alkaline solution. The acid is extracted by dry acetone, in which glycerine is insoluble.—Action of ethyloxalyl chloride upon aromatic hydrocarbons in presence of aluminium chloride, by M. L. Bouveault. Reaction readily occurs with benzene, toluene, and metaxylene, more difficultly with cymene, with production of the corresponding substituted glyoxylic ethers. With cymene, a new ethyl cymene is obtained as a bye-product.—New derivatives of the cyanoacetic ethers, by M. Guinchant.—Physiological study of the Cyclamens of Persia, by MM. A. Hébert and G. Truffant. The methods of high culture usually followed for these ornamental plants do not necessarily give the largest flowers, a rich soil giving large leaves and small flowers, a poor soil the reverse.—On a new soluble oxidising ferment of vegetable origin, by M. G. Bertrand. The browning of the cut surfaces of certain vegetables, dahlia, apple, and others, is due to the oxidation of the tyrosine under the influence of a soluble ferment, an oxydase. It can be isolated from the roots of the dahlia.—On the buccal and œsophageal pouches of the *Prosobranchia*, by M. A. Amaudrut.—General observations on the distribution of the Algæ in the Bay of Biscay, by M. C.

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Sauvageau.—On some Devonian bacteria, by M. B. Renault. Two species of micrococcus are described, found on fossil vegetation of the Devonian age. These are the earliest known bacteria.—On the photography of the retina, by M. Th. Guilloz. —Influence of the liver on the anti-coagulating action of peptone, by MM. E. Gley and V. Pachon.

BERLIN.

Meteorological Society, May 5.—Prof. Börnstein, President, in the chair.—Dr. Carl Müller spoke on the adaptation of plants to climate and weather, and discussed the mechanisms by which they take up water and carbon dioxide from the air, as also the various configurations of the earth's surface which either assist, limit or regulate transpiration in dependence upon climate and weather. He further gave a sketch of the means by which radiation is limited during the night, and by which the access of light to the assimilative chlorophyll corpuscles is facilitated and regulated, as also of the multitudinous arrangements for the avoidance of the deleterious action of heavy rain and violent winds.

Physiological Society, May 8.—Prof. du Bois Reymond, President, in the chair.—Dr. Cohnstein discussed certain recent papers dealing with the theory of lymph formation which oppose Heidenhain's view that it is the result of a secretory process, and tend to prove that diffusion and osmosis suffice entirely to explain the passage of the constituents of lymph through the walls of the capillaries.—Prof. I. Munk spoke on muscular work and proteid metabolism, and combated Chauveau's most recent views that the necessary energy is supplied by the oxidation of carbohydrate rather than of proteid material.

Physical Society, May 15.—Prof. du Bois Reymond, President, in the chair.—Prof. Warburg spoke on the action of light on sparking discharge, and demonstrated Hertz's earliest experiments on the influence of ultra-violet rays on the striking distance of the sparks, and on the discharge of negatively electrified bodies. He next showed Hallwach's experiments dealing with spark discharge in light, and finally his own, by which he proved that the action of ultra-violet rays consists in doing away with the retardation which, according to Jaumann's researches, exists at each discharge. This retardation, which is a forerunner of the discharge, and during which some as yet unknown events take place in the path of the spark, is lessened or even completely done away with by the action of light. He conjectured that gases, unlike electrolytes and metals whose conductivity is independent of strength of current, only become conductors when the current has reached a certain intensity. Hence possibly during the retardation the gas is becoming a conductor, and if so the action of light consists in the removal of some obstruction to the establishment of conduction.—Prof. Paalzow gave an obituary notice of the recently deceased member of the Society, Dr. Haensch.

PHILADELPHIA.

Academy of Natural Sciences, May 5.—Dr. F. P. Henry made a communication on *Filaria sanguinis hominis nocturna*, specimens of which had been obtained from the blood of a patient suffering from chyluria due to clogging of the lymphatics by the ova of the parasite. The various forms of the worm, with their life-history, as given by Dr. Patrick Manson, were dwelt on.

May 12.—Dr. Charles S. Dolley described a centrifugal apparatus, which he called a Planktonokrit, for the quantitative determination of the food supply of oysters and other aquatic animals. By means of its use he is enabled to make a large number of plankton estimates in a day, and thus judge of the characters of given areas of water in connection with fish and oyster culture at different times of the day, states of the tide, varying depths, &c. The method employed is that of the centrifuge, an apparatus which consists of a series of geared wheels driven by hand or belt, and so arranged as to cause an upright shaft to revolve up to a speed of 8000 revolutions per minute, corresponding to fifty revolutions per minute of the crank or pulley-wheel. To this upright shaft is fastened an attachment by means of which two funnel-shaped receptacles of one litre capacity each may be secured and made to revolve with the shaft. The main portion of each of these receptacles is constructed of spun copper, tinned. When caused to revolve for one or two minutes the entire contents of suspended matter in the contained water is thrown to the bottom of tubes properly placed, from which the amount may be read off by means of a graduated scale.

BOOKS, PAMPHLET, and SERIALS RECEIVED.

BOOKS.—Cosmic Ethics; or, the Mathematical Theory of Evolution: W. C. Thomas (Smith, Elder).—Modern Optical Instruments: H. Orford (Whittaker).—Engineer Draughtsmen's Work (Whittaker).—Azimuth Tables for the Higher Declinations: H. B. Goodwin (Longmans) —Latitude and Longitude: W. J. Millar (Griffin).—Sporozoenkunde: Dr. von Wasielewski (Jena, Fischer) —Elementarcurs der Zootomie in Fünfzehn Vorlesungen: Drs. B. Hatschek and C. J. Cori (Jena, Fischer).—Apollonius of Perga, Treatise on Conic Sections: edited in Modern Notation by T. L. Heath (Cambridge University Press).—An Introductory Treatise on the Lunar Theory: Prof. E. W. Brown (Cambridge University Press).

PAMPHLET.—Staten Island Names: W. T. Davis (New Brighton, New York).

SERIALS.—L'Anthropologie, tome 7, No. 2 (Paris, Masson).—Botanische Jahrbücher, &c., Einundzwanzigster Band, v. Heft (Leipzig, Engelmann).—Sitzungsberichte der K. B. Gesellschaft der Wissenschaften Math. Naturw. Classe, 1895, i. and ii. (Prag).—Century Illustrated Magazine, June (Macmillan).—History of Mankind: F. Ratzel, translated, Part 9 (Macmillan). Bulletin from the Laboratories of Natural History of the State University of Iowa, Vol. 3, No. 4 (Iowa) —Brain, Part 73 (Macmillan).—Humanitarian, June (Hutchinson).—National Review, June (Arnold).—Contemporary Review, June (Isbister).—Scribner's Magazine, June (Low).—Journal of the Anthropological Institute, May (K. Paul).—Bachelor of Arts, May (New York).—Zeitschrift für Physikalische Chemie, xx. Band, 1 Heft (Leipzig, Engelmann).

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